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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 10/005,244 | 12/03/2001 | Dieter Klaus Weller | 010949 | 7904 |

23464 7590 11/02/2004

BUCHANAN INGERSOLL, P.C.
ONE OXFORD CENTRE, 301 GRANT STREET
20TH FLOOR
PITTSBURGH, PA 15219

EXAMINER

BERNATZ, KEVIN M

ART UNIT PAPER NUMBER

1773

DATE MAILED: 11/02/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|------------------------------|------------------------|---------------------|--|
| Office Action Summary | Application No. | Applicant(s) | |
| | 10/005,244 | WELLER ET AL. | |
| | Examiner | Art Unit | |
| | Kevin M Bernatz | 1773 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-32 is/are pending in the application.
- 4a) Of the above claim(s) 1-12 and 20-26 is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 13-19 and 27-32 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____. |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date ____. | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Response to Amendment

1. Amendments to claims 13, 17, 27 and 31 filed on August 6, 2004, have been entered in the above-identified application.
2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claim Rejections - 35 USC § 102

3. Claims 13 – 19 and 27 – 32 are rejected under 35 U.S.C. 102(a) and 102(e) as being anticipated by Kikitsu et al. (U.S. Patent No. 6,602,620 B1).

Regarding claims 13 and 27, Kikitsu et al. disclose a magnetic recording disk, i.e. "data storage medium" for magnetic recording (*Title*) comprising a disk substrate (*Figures 6 and 9, layers 10 and 20*) having a locking pattern formed therein (*see Figure 1 below*), the locking pattern comprising a plurality of pits formed in the disc substrate (*area of pits partially entering the optional underlayer 20*), and a plurality of nanoparticles completely filling each of the plurality of pits (*element 35*) and exhibiting short-range order characteristics (*Figures 4, 5, 13A, 13B, 28 and 29*).

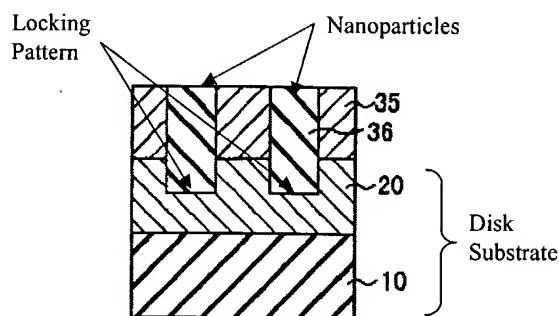


Figure I: Reproduction of Kikitsu et al. Figure 6 showing “locking pattern”

Regarding claims 14, 17, 28 and 31, Kikitsu et al. disclose nanoparticles and “pit depths” meeting applicants’ claimed limitations (*Figures 13 - 15; col. 25, lines 1 – 20; and Table 1*). The Examiner notes that while Figure 6 shows the pits being filled with the non-magnetic material, that Kikitsu et al. clearly teaches that the pits can be filled with magnetic material instead (with a non-magnetic matrix versus the magnetic matrix).

Regarding claims 15, 16, 29 and 30, Kikitsu et al. disclose nanoparticles and substrate materials meeting applicants’ claimed limitations (*col. 25, lines 26 – 38; col. 31, lines 48 – 67; and examples*). Regarding the substrate materials, the Examiner notes that applicants’ claims are open to the “substrate” comprising multiple layers.

Regarding claims 18 and 32, Kikitsu et al. disclose a coherence length scale meeting applicants’ claimed limitations (*Figures 28 and 29*).

Regarding claim 19, Kikitsu et al. disclose a protective layer meeting applicants’ claimed structural limitations (*examples*).

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4. Claims 13 – 19 and 27 – 32 are rejected under 35 U.S.C. 102(e) as being anticipated by Asakawa et al. (U.S. Patent App. No. 2003/0222048 A1).

Regarding claims 13 and 27, Asakawa et al. disclose a magnetic recording disk, i.e. “data storage medium” for magnetic recording (*Title*) comprising a disk substrate (*Paragraph 0171*) having a locking pattern formed therein (*Paragraph 0171 – “etched region of the non-magnetic substrate”*), the locking pattern comprising a plurality of pits formed in the disc substrate (Figure 4C), and a plurality of nanoparticles completely filling each of the plurality of pits (*Paragraphs 0171, 0219 and 0488*) and exhibiting short-range order characteristics (*Figures 1, 4C, 8A and 8B*).

Regarding claims 14, 17, 28 and 31, Asakawa et al. disclose nanoparticles and “pit depths” meeting applicants’ claimed limitations (*Paragraphs 0149, 0315 and 0488*).

Regarding claims 15, 16, 29 and 30, Asakawa et al. disclose nanoparticles and substrate materials meeting applicants’ claimed limitations (*Paragraphs 0488, 0526 and 0527*).

Regarding claims 18 and 32, Asakawa et al. disclose a coherence length scale meeting applicants’ claimed limitations (*Paragraphs 0232 and 0488*).

Regarding claim 19, Asakawa et al. disclose a protective layer meeting applicants’ claimed structural limitations (*Paragraph 0510*).

Response to Arguments

5. The prior rejection of claims 13 – 19 and 27 - 32 under 35 U.S.C § 102(a), 102(e) and/or 103(a) – Black et al.

The above noted rejection has been withdrawn because applicant(s) amendment(s) have set forth new limitations (e.g. “the locking pattern comprising a plurality of pits formed in the disc substrate”) no longer anticipated, nor rendered obvious, by the above noted rejection.

6. The rejection of claims 13 – 19 and 27 - 32 under 35 U.S.C § 102(a) and 102(e) – Kikitsu et al.

Applicant(s) argue(s) that “[t]here is no locking pattern of any type formed in the substrate of Kikitsu, and Kikitsu does not teach or suggest any physical modification to the substrate” (*page 10 of response*). The examiner respectfully disagrees.

The examiner notes that the specification is not the measure of the invention. Therefore, limitations contained therein can not be read into the claims for the purpose of avoiding prior art. *In re Sporck*, 55 CCPA 743, 386 F.2d 924, 155 USPQ 687 (1968). Applicants appear to be taking a very limited definition of the limitation “substrate”, which the Examiner deems is improper. Applicants are reminded that the term(s) in the claim must be given the broadest reasonable interpretation(s) consistent with the written description in applicants’ specification as it would be interpreted by one of ordinary skill in the art. *In re Morris*, 127 F.3d 1048, 1054-55, 44 USPQ2d 1023, 1027 (Fed. Cir. 1997); *In re Donaldson Co., Inc.*, 16 F.3d 1190, 1192-95, 29 USPQ2d 1845, 1848-50

(Fed. Cir. 1994). See MPEP 2111. Specifically, the “substrate” is merely the layer or layers on which the nanoparticles are deposited. In the instant case, Kikitsu et al. clearly teach forming a “locking pattern comprising a plurality of pits” on such a substrate.

Applicants further argue that “particles *per se* are not placed in the holes formed in the non-magnetic film, but rather, a magnetic material is deposited into the holes, with the magnetic material thereby forming a magnetic particle in each of the holes” (*page 10 of response*) and that the “self-assembly of nanoparticles due to their short-range order characteristics, as recited in independent claims 13 and 27, is distinctly different from the one particle to one hole approach taught by Kikitsu” (*ibid*). The Examiner respectfully disagrees.

The Examiner notes that the method by which the product is formed is not germane to the determination of patentability of a *product claim*. Specifically, in a product claim, as long as the prior art product meets the claimed structural limitations, the method by which the product is formed is not germane to the determination of patentability of the product ***unless*** an unobvious difference can be shown to result from the claimed process limitations. In the instant case, the Examiner fails to see any difference in the final product whether formed particles are deposited into the holes or whether the particles are formed in the holes. In both cases, a patterned magnetic recording medium possessing high areal recording density and uniform particle + magnetic domain sizes would be formed. Finally, the Examiner notes that applicants have not claimed that the particles are formed by self-assembly, but merely that they

exhibit short-range order characteristics. The particles in the holes formed by Kikitsu et al. clearly exhibit said order.

Finally, applicants argue that "Kikitsu includes no teaching or suggestion of depositing a plurality of nanoparticles in a hole" (*page 11 of response*), thereby not teaching or suggesting the limitations recited in independent claims 13 and 27. The Examiner respectfully disagrees.

The Examiner notes that while applicants present claims do not recite that each pit comprises a plurality of nanoparticles, but rather that a plurality of nanoparticles completely fills each of the plurality of pits. As shown in Figure 2 below, Kikitsu et al. clearly teaches a plurality of nanoparticles completely filling each of the plurality of pits (i.e. no pit in the entire Kikitsu et al. surface is left empty). Applicants are suggested to reword the claim to distinctly claim that each individual pit must comprise a plurality of nanoparticles therein should applicants desire to pursue such an embodiment.

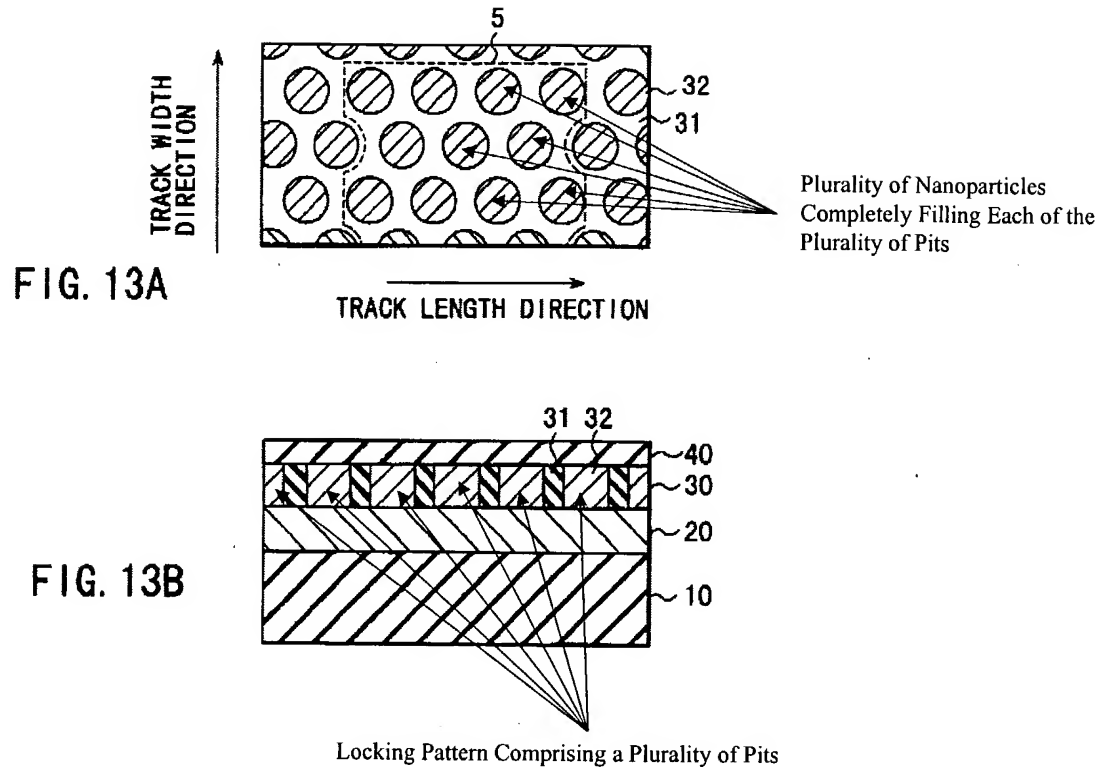


Figure II – Illustration of a plurality of nanoparticles completely filling each of the plurality of pits in the Kikitsu et al. invention

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Daimon et al. (U.S. Patent No. 5,139,884) and Aiba et al. (U.S. Patent No. 6,541,386 B2) teach that it is known in the art to form holes in a substrate (usually aluminum via anodic oxidation) and then deposit magnetic material into the

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holes to form a patterned perpendicular/vertical magnetic recording medium (*entire disclosures of both references*).

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Applicants' amendment resulted in embodiments not previously considered (i.e. "the locking pattern comprising a plurality of pits formed in the disc substrate") which necessitated the new grounds of rejection, and hence the finality of this action.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin M Bernatz whose telephone number is (571) 272-1505. The examiner can normally be reached on M-F, 9:00 AM - 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Deborah Jones can be reached on (571) 272-1535. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Kevin M. Bernatz, PhD.
Primary Examiner

October 29, 2004